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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,749	07/31/2001	Yasutaka Ito	110575.01	2777

25944 7590 12/03/2004

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

JEFFERY, JOHN A

ART UNIT

PAPER NUMBER

3742

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,749

Applicant(s)

ITO, YASUTAKA

Examiner

John A. Jeffery

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/9/04 & 10/27/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20040909.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 29, 30, 32-35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP11-204238 in view of Jordan et al (US1998764), Kimura (US5331134), and further in view of Kawanabe et al (US6133557). JP11-204238 discloses a ceramic wafer heater comprising a flat electric heating element 34 ("heat generation pattern") embedded in an aluminum nitride ceramic base. As best seen in Figs. 1, 7a, and 7b, the heat generation pattern 34 does not overlap itself in a contacting manner.

The claims differ from JP11-204238 in calling for offsetting at least part of the heat generation pattern on a level different from that of others of the pattern in a substrate thickness direction. Offsetting a single electric heater in a thickness direction in a substrate is well known in the art as evidenced by Jordan et al (US1998764) noting Fig. 2 where electric heater b is offset in the thickness direction of substrate d so that a desired heating gradient is achieved. In view of Jordan et al (US1998764), it would

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have been obvious to one of ordinary skill in the art to offset the resistive electric heating pattern of JP11-204238 so that a desired heating gradient was achieved using a single element thereby providing a desired gradient along the radial direction of the planar heating surface.

Although JP11-204238 does not expressly specify the amount of distance the heater is offset, offsetting electric heaters at a distance of 500μ is conventional and well known in the art as evidenced by Kimura (US5331134) noting electric heaters 2, 2' which are offset from each other by the thickness of the ceramic substrate 1. As noted in col. 3, lines 41-42, the minimum thickness of the ceramic substrate is 0.5 mm (500μ). As noted in col. 1, line 58 - col. 2, line 12, providing two offset heaters improves temperature uniformity over the whole surface of the heater. In view of Kimura (US5331134), it would have been obvious to one of ordinary skill in the art to offset the electric heaters at a 500μ distance in the previously described apparatus in order to compensate for temperature nonuniformities in the planar heating surface thereby improving uniformity of heating. With regard to the claims reciting upper limits having lower values of offset, the chosen offset distance would be obvious to one of ordinary skill in the art given a desired heating pattern along the substrate surface. Given a certain tolerance for temperature deviations along the substrate surface, one of ordinary skill in the art would know to limit the offset between heaters to a specified amount to minimize such temperature deviation.

The claims also differ from the previously cited prior art in calling for the ceramic substrate to be sintered. But sintering a ceramic substrate to increase its thermal shock

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resistance is well known in the art as evidenced by Kawanabe et al (US6133557) in col. 12, lines 28-45. Not only does sintering increase the ceramic's thermal shock resistance, but also enhances its corrosion resistance. In view of Kawanabe et al (US6133557), it would have been obvious to one of ordinary skill in the art to sinter the ceramic substrate of the previously described apparatus to not only increase its thermal shock resistance, but also enhance corrosion resistance.

Claims 31, 36, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP11-204238 in view of Jordan et al (US1998764), Kimura (US5331134), Kawanabe et al (US6133557), and further in view of Nobori et al (US5616024). The claims differ from the previously cited prior art in calling for the heater to comprise a spiral wire having specified thickness, width, and aspect ratio. Providing a spiral wire embedded in a ceramic substrate is conventional and well known in the art as evidenced by Nobori et al (US5616024) noting spiral wire 3. See Fig. 1. See also Fig. 8 and coil 25. According to col. 16, lines 44-49, the coil has a 0.5mm thickness and width of 2.5mm. Moreover, the aspect ratio is between 1.5 - 3.0. See col. 8, line 44 - col. 9, line 13. As is well known in the art, spiraling an electric heater provides numerous advantages over a straight electric heater including (1) maximizing heating element area per unit length of the heater by spiraling the heater, and (2) providing more flexibility in the heater structure thereby accounting for thermal expansion. In view of Nobori et al (US5616024), it would have been obvious to one of ordinary skill in the art to provide a spiraled electric heater in lieu of the electric heater

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structures of the previously described heaters in order to (1) maximize heating element area per unit length of the heater by spiraling the heater, and (2) provide more flexibility in the heater structure thereby accounting for thermal expansion.

With regard to claim 36, although Nobori et al (US5616024) does not specifically express the anti-thermal shock properties of the ceramic substrate in the terms claimed, Nobori et al (US5616024) does, however, expressly teach that the ceramic substrate has improved thermal shock properties. See col. 12, lines 61-63, col. 16, lines 20-24, and col. 21, lines 26-35. In view of the choice of ceramic materials to improve resistance to thermal shock in Nobori et al (US5616024), no criticality is seen in the specific anti-thermal shock property claimed over that specified in Nobori et al (US5616024).

Response to Arguments

Applicant's arguments have been considered but are deemed to be moot in view of the new grounds of rejection. Applicant asserts that the heat generation pattern of JP 238 overlaps itself in a contacting manner. In making this assertion, applicant primarily relies on the orientation of heat generating patterns 23A and 24A of Figs. 5(a)-(c).

Remarks, P. 5.

The examiner, however, notes that the heat generation pattern shown in Figs. 1, 7a, and 7b fully meets the added limitation that the heat generation pattern not overlap itself in a contacting manner. The reference fully reads on the limitation as noted in the rejection.

Other Pertinent Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant should (1) separately consider the art, and (2) consider the art together with the previously cited prior art for potential applicability under 35 U.S.C. §§ 102 or 103 when responding to this action. US 434 and 211 disclose heaters relevant to the instant invention.

Conclusion

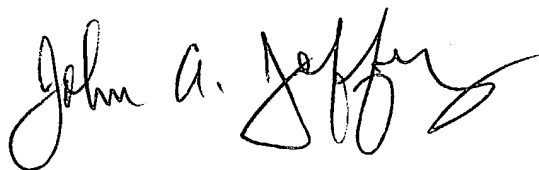
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Jeffery whose telephone number is (571) 272-4781. The examiner can normally be reached on Monday - Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans, can be reached on (571) 272-4777. All faxes should be sent to the centralized fax number at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "John A. Jeffery". The signature is fluid and cursive, with a large, stylized "J" and "A".

**JOHN A. JEFFERY
PRIMARY EXAMINER**

11/24/04